

# The Department of Defense (DoD) Global Influenza Surveillance Program

## Quick Facts

### DoD Global Influenza Surveillance Program has three components

- Laboratory-based Surveillance
  - \* Air Force Institute for Operational Health (AFIOH)
- Population-based Surveillance
  - \* Naval Health Research Center (NHRC)
- DoD overseas medical research facilities

### Surveillance Sites are global

- US, Europe, Middle East, Asia-Pacific, South America
- AFIOH sites
  - \* 32 Sentinel, 44 Non-sentinel
  - \* 2 Overseas research facilities
- NHRC sites
  - \* 8 training sites
  - \* 6 shipboard sites

### Specimen Collection

- Request a sample of specimens/week
  - \* Nasal wash (preferred)
  - \* Throat swab
- Patients = DoD beneficiaries and foreign nationals (DoD overseas facilities) meeting influenza-like illness (ILI) case definition
- ILI = fever  $\geq 100^{\circ}$  F/ $38^{\circ}$ C oral or equivalent AND cough or sore throat of < 72 hours duration

### Specimen Processing

- Specimens tested for
  - \* Influenza A and B
  - \* Adenovirus
  - \* Parainfluenza 1-3
  - \* Enterovirus
  - \* Respiratory syncytial virus
  - \* Herpes simplex virus
- All influenza isolates are typed, a portion are subtyped:
  - \* All overseas isolates
  - \* Isolates of interest from remaining sites
- Select specimens sent to CDC
  - \* Select isolates subtyped and antigenically characterized
  - \* Original samples for possible candidate material for vaccine production

### Average Annual Workload

- AFIOH laboratory
- 4,300 specimens/year
    - \* 560 (15%) influenza A
    - \* 180 (5%) influenza B
- NHRC laboratory
- 2,300 specimens/year
    - \* 1,500 (61%) adenovirus
    - \* 60 (3%) influenza A
    - \* 17 (1%) influenza B

*The Presidential Decision Directive NSTC-7 (June 1996) charged the DoD with expanding its mission to "support global surveillance, training, and response to emerging infectious disease threats". More specifically, a Health Affairs Policy (February 1999) states that DoD will be able "to conduct global, operationally relevant, laboratory-based influenza surveillance".*

## Background

The DoD Global Emerging Infections Surveillance and Response System (DoD-GEIS) established a DoD-wide influenza surveillance network in 1997 that coupled existing surveillance systems from the Air Force (influenza surveillance established in 1976) and the Navy (adenovirus surveillance established in 1996). The Air Force Surgeon General was appointed as the Executive Agent for the program, with management responsibility given to the Air Force Institute for Operational Health (AFIOH), located at Brooks City-Base, in San Antonio, TX. The Navy's adenovirus surveillance was expanded to include febrile respiratory illnesses and is managed by the Naval Health Research Center (NHRC), lo-

cated at San Diego, CA. DoD-GEIS provides funding, programmatic support, and professional guidance to both the Air Force and the Navy in administering the DoD Global Influenza Surveillance Program.

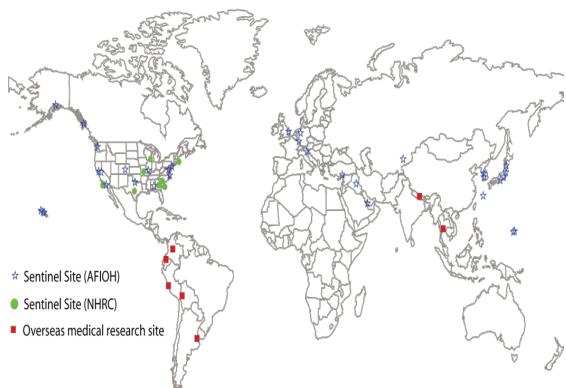
Extended resources include the DoD overseas medical research facilities that conduct infectious disease research and are located in geographical areas of interest, including Africa, Asia, and South America. The value of the overseas facilities is twofold. First, the sites provide advance warning of national and international disease threats. Second, the sites augment the WHO's influenza surveillance program.

## Surveillance Populations

The Program provides an interesting and unique confluence of national and international respiratory disease data from DoD beneficiaries within the U.S. Air Force, Army, Navy, and Coast Guard, as well as foreign nationals through the DoD overseas medical research facilities. Recent participation includes deployed Air Force locations in Central Asia and the Middle East (i.e., Iraq, Qatar, and Kyrgyzstan) and six navy shipboard sites.

rectly to WHO Influenza Collaborating Centers.

Any DoD medical treatment facility may participate. However, select sentinel sites are chosen according to their location and mission (i.e., potential for emergence of new strains, importation, future military operations, areas with high troop concentrations and highly mobile/rapid response units).



Two DoD overseas research laboratories have participated in the program to date: Naval Medical Research Center Detachment (NMRC-D) in Lima, Peru (collecting specimens from local residents in Argentina, Bolivia, Ecuador, Peru, and Colombia) and the Armed Forces Research Institute of Medical Sciences (AFRIMS) in Bangkok, Thailand (collecting specimens from local residents in Nepal, and Thailand). DoD laboratories in Egypt and Indonesia send influenza data and specimens di-

## Role in Global Surveillance

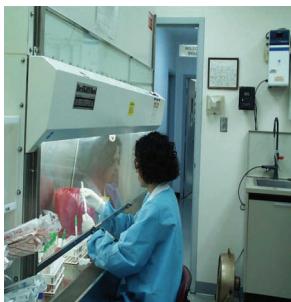
The DoD influenza surveillance system is an important source of information regarding the impact of global influenza. The resources in remote locations allow the Program to potentially be the first to identify new or emerging strains. Each year the Program expands to pro-

vide early warnings of threats to DoD populations. Its contribution to the Vaccines and Related Biological Products Advisory Committee (VRBPAC) and other partners is valued and impacts both the health of the US military and global health.



III soldiers during the 1918 influenza pandemic. The US military's high mobility and world-wide locations create a particularly vulnerable population.

The Program provides an interesting and unique confluence of national and international respiratory disease data...



The AFIOH laboratory is accredited by the College of American Pathologists and is the central viral laboratory for the DoD Influenza Surveillance Program.

## Surveillance at the Air Force Institute for Operational Health (AFIOH)

### Specimen Collection

AFIOH provides sites with educational presentations and specimen collection kits. Sites are requested to collect 6-10 viral culture specimens per week and case data from patients meeting the

case definition for influenza-like illness (ILI). Sites are contacted when specimens submitted increase unexpectedly, since an outbreak may be occurring.

### Specimen Processing

Specimens are processed in BSL-2 conditions (BSL-3 available) and tested for influenza A and B, adenovirus, parainfluenza 1-3, enterovirus, respiratory syncytial virus (RSV), and herpes simplex virus (HSV). All influenza isolates are typed as A or B and a portion are subtyped using hemagglutination-inhibition (HI) or polymerase chain reaction (PCR) procedures. A sample of these isolates also undergo molecular sequencing in order to iden-

tify significant amino acid changes.

Select isolates and all sequence data are sent to the Centers for Disease Control and Prevention (CDC) for further subtyping and antigenic characterization. Furthermore, original samples are provided for possible candidate material for vaccine production. Currently, only original sample material for growth in eggs is acceptable for vaccine production.

### Activities

**Reporting.** Several programmatic reports are produced throughout the year for a variety of organizations, including base staff (lab and public health office), VRBPAC, and GEIS.

Lab-confirmed specimen results are coupled with demographic data and shared electronically on the AFIOH and GEIS web-based reporting systems. Additionally, surveillance information is shared at conferences worldwide.

**Additional surveillance.** The Electronic Surveillance System for the Early Notification of Community-based Epidemics (ESSENCE) is a DoD-wide system that provides early detection of infectious disease outbreaks at medical treatment facilities.

AFIOH reviews ESSENCE data daily as a supplemental tool for the Program in identifying respiratory outbreaks. In the event of increased respiratory visits occurring at a particular site, AFIOH

**Recent Developments.** Influenza fluorogenic RT-PCR probe sets were designed, developed, and validated by the AFIOH laboratory to rapidly detect influenza, including one probe targeting H5 influenza. Human influenza H3 and H1 subtype specific probes are currently being designed, tested, and evaluated in clinical isolates at AFIOH.

**Vaccine Effectiveness Studies.** Studies aimed at assessing the annual effectiveness of the influenza vaccine are done at AFIOH and NHRC. Vaccine effectiveness data are presented at professional meetings and published.

**Consultation.** AFIOH provides training, guidance, and instruction (including site visits) to public health and laboratory personnel at participating sites and overseas research facilities. Training and guidance are also provided by Navy Environmental and Preventive Medicine Units.

### Contributions

**Influenza Vaccine.** Seasonal summaries of the surveillance data are annually presented to VRBPAC to assist in the decision-making process for the upcoming season's vaccine.

The Program's ability to provide not only specimens from remote locations, but also original samples for vaccine production has historically demonstrated its impact on vaccine compositions for both the Northern and Southern hemispheres.

**Rapid Awareness.** Continuous surveillance of

laboratory data allow public health officials in the military and surrounding civilian communities to become immediately aware of potential outbreaks and respond with appropriate public health measures.

All specimen data, including demographical information, are sent to the CDC to be included in the US and Global Influenza Surveillance Programs. As a result of these contributions, AFIOH became a WHO Collaborating Laboratory in February 2003.



Contact AFIOH - Website <https://gumbo.brooks.af.mil/pestilence/Influenza/>  
E-mail: [influenza@brooks.af.mil](mailto:influenza@brooks.af.mil) Phone: (210) 536-3471, DSN 240-3471

Contact NHRC - Website <http://www.nhrc.navy.mil/geis/> or E-mail: [fri@nhrc.navy.mil](mailto:fri@nhrc.navy.mil)  
Phone: (619) 553-7027, DSN 553-7027

